IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

LG DISPLAY CO., LTD., Plaintiff, v. CHI MEI OPTOELECTRONICS CORPORATION, et al. Defendants.	Civil Action No. 06-726 (JJF) Civil Action No. 07-357 (JJF) **CONSOLIDATED CASES**

RESPONSE OF PLAINTIFF LG DISPLAY CO., LTD. TO AUO'S OPENING CLAIM CONSTRUCTION BRIEF

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LG Display Co., Ltd. ("LGD") hereby submits its response to AUO's opening brief.

I. CONSTRUCTION OF DISPUTED CLAIM TERMS OF THE LGD PATENTS

A. U.S. Patent No. 4,624,737 – the "Improved TFT" patent

AUO misconstrues the patent's teachings, relies on extrinsic evidence to improperly limit the claims. Further, AUO urges arguments that were already rejected by the California Court.

1. *"oxidizing atmosphere" / "without exposing them to an oxidizing atmosphere"*[1]

AUO ignores both the claim language and the specification, which clearly identifies the invention as being directed to preventing the formation of a "natural oxide" on the films in order to improve their electrical contact. 1:32-53. As the California Court recognized, an atmosphere with *any* oxidizing agent may not be sufficient to create an oxide -- "*de minimus* amount of oxidation [allowed per AUO's construction] is not an 'oxidation atmosphere.'" D.I. 384 at 13, discussing Ex. L-4(a) at 9. Instead, the California Court correctly held that a detectable amount of oxidation on a film is required to accurately characterize an "oxidizing atmosphere."

2. *"continuously depositing"*

AUO's proposed construction improperly seeks to limit "continuously depositing" to a specific precipitating process. There is nothing in the claim language or specification that requires such a limitation. Instead, "depositing" should be more broadly construed as "the formation of the gate insulating film, the high-resistivity semiconductor film and conducting film without intervening films," as both LGD and CMO advocate. As previously discussed, the specification uses the more general term "forming" to describe the deposition step, and refers to precipitation only as an example ("…for instance…"). D.I. 384 at 15-16, citing 2:19-23 ("a gate

[1] Though AUO asserts that the term "them" is indefinite, LGD contends this argument is baseless as the meaning of them is clear from the language of the claim itself.

insulating film 3, a high-resistivity film 4, a low-resistivity film a-Si:H (usually hydrogenated amorphous silicon) film 20 and a conducting film 30 made of a metal or other material are *successively formed* on the gate electrode 2 and substrate 1…"); 2:24-31 ("Such successive deposition can be accomplished, for instance, by *forming* a silicon nitride (SiNx) film as a gate insulating film 3…, *forming* a high-resistivity a-Si:H film 4…and *forming* a n+ a-Si:H film 20…. It is also possible *to form* said films successively….").

3. *"said source and drain electrode serving as at least part of a mask*

AUO's argument that the source and drain electrode must define a boundary must fail because it ignores the clear language of the claims and has already been rejected by the California Court. D.I. 384 at 14-15. AUO misconstrues the specification and claims when it suggests that Figs. 2c and 3d and the steps of the claim require that the source and drain electrodes define a boundary of removal. Instead, the claims unambiguously require that the source and drain electrode serve as "at least part", and not necessarily all, of the mask, without any additional limitations. AUO cannot disregard this language.

4. *"forming…on" / "depositing on"*

The focus of this dispute is whether the term "on" requires direct contact between the layer in question and the gate electrode or substrate. As previously explained in detail (D.I. 384 at 13-14), AUO's construction of "on" as requiring direct contact with the electrode or substrate must be rejected as inconsistent with the claim language. For example, the claim recites that the island region (from the high-resistivity semiconductor film and conducting film) is "on" the gate electrode. The island region, however, is clearly not in direct contact with the gate electrode because there is an intervening gate insulating layer between the gate electrode and the high-resistivity semiconductor layer of the island. 4:27-29, 32-35.

5. *"a fourth step for selectively forming a source electrode and a drain electrode"*

AUO's attempt to construe this element as a "step-plus-function" limitation is unwarranted. This claim language, like the other elements of method claim 1, recites no function but only the acts to be performed during that step. There is thus no reason to construe this limitation as a step-plus-function element under 35 U.S.C. § 112(6). *See O.I. Corp. v. Tekmar Co., Inc.*, 115 F.3d 1576, 1583-1584 (Fed. Cir. 1997) (§ 112 ¶ 6 does not apply when acts are recited in the claim); *Advanced Medical Optics, Inc. v. Alcon Inc.*, 361 F. Supp. 2d 370, 398 (D. Del. 2005) (noting "fully applicable here is the Federal Circuit's express reluctance to interpret claims elements as step-plus-function limitation simply because 'ing' verb is in play….").

B. U.S. Patent No. 5,019,002 – the "ESD Protection" patent

AUO's constructions do not provide the necessary guidance to avoid the ambiguity that arose in the previous CPT litigation regarding the '002 patent. D.I. 384 at 6-11. Moreover, AUO does not adopt any of this Court's previous constructions and provides an insufficient basis for modifying them. AUO's constructions improperly import a number of limitations.

1. *"interconnecting substantially all of said row and column lines to one another and substantially all of said column lines to one another"*

LGD proposes the construction "electrically connecting with conductive material all or nearly all row lines to at least one other row line and electrically connecting with conductive material all or nearly all of the column lines to at least one other column line."

a. *"interconnecting"*

AUO's argument that "joining" clarifies "interconnecting" is nonsensical. AUO argues that "interconnecting" should not be construed as electrically connecting because electrically connecting could possibly include indirect connecting. AUO, however, fails to provide any reasoning as to how the term "joining" would address this alleged ambiguity. Further, joining

would provide no guidance to the electrical conduction aspect of the term. The specification clearly provides that the invention provides a conductive path and, accordingly, including "electrically connecting" is appropriate. (D.I. 384 at 7-8.)

b. *"one another"*

AUO's assertion that interconnecting requires connecting "almost all together" is contradicted by the claim and the specification. The claim language does not recite "together" and should not be so limited. A number of interconnections contradicting AUO's construction are disclosed. Fig. 4; 2:29-36; 5:65-68; 6:6-9; *see also* Ex. L-2(c) (U.S. Patent 4,820,222 at Fig 7; 7:40-42). Further, AUO's construction precludes "all" and should be rejected.

2. *"resistance"*

AUO argues that LGD's construction of resistance should be rejected because it removes the word "specified" from the Court's previous construction. However, as previously explained, "specified" created confusion in the CPT trial. (D.I. 384 at 10-11.) AUO also asserts, contrary to this Court's prior ruling, that a resistance should be limited to a resistor by its construction, "a specified ratio." LGD incorporates the well-established meaning. *Id.*

3. *"to provide protection from electrostatic discharges between said row and column activation lines during manufacturing of the display" / protection from electrostatic discharges" / "row and column activation lines"*

The term must be construed in the context of the claim language that further states "via a resistance to provide protection from electrostatic discharges between said row and column activation lines." 9:7-10. Thus, the claim language clearly links the protection language to the resistance element, and LGD's construction "to minimize current surge in the TFT array from electrostatic discharge during manufacture of the display" accurately reflects the meaning in the context of the claims. Moreover, AUO's assertion that LGD ignores the language of "between

said row and column lines" is incorrect. As described in the specification, electrostatic discharge occurs at the crossover points between the row and column lines *in the TFT array* and can also occur within the TFT itself. 4:49-53; Figs. 2, 3.

4. *"outer electrostatic discharge guard ring"*

LGD and CMO propose that this Court adopt its previous construction. AUO contends that this Court should limit the construction for both inner and outer guard rings to only a "surrounding structure." AUO's construction disregards the description in the specification of guard rings. 7:18-21. The intrinsic evidence does not require surrounding structures.

5. *"removing said outer guard ring and row and column interconnections"*

LGD and CMO propose that this Court adopt its previous construction that provides clear guidance on the meaning of the term. AUO's construction adds unnecessary and incorrect language. AUO's attempts to distort the claim language by asserting that "row and column interconnections" does not have antecedent basis. To the contrary, the preceding element clearly interconnects the row and column lines, thus providing proper antecedent basis. AUO also interjects the ambiguous term "lines connecting/joining" into the construction. AUO's additional language is unsupported and thus should be rejected.

6. *"forming a pattern of pixels on said substrate"*

AUO incorrectly urges that the pattern of pixels must be in direct contact with the substrate. This is not required by the claims and is inconsistent with the specification. For example, a suppression layer 30 can be formed on the substrate followed by the ITO layer 32, which forms the pattern of pixels. 4:13-22; *see also* 4:67-5:6. Thus, forming a pattern of pixels should not be limited to require direct contact with the substrate.

C. U.S. Patent No. 5,825,449 – the "Substrate Wiring Design" patent

1. *"one of said first and second conductive layers" / "one"*

AUO repeats the same misstatements made by CMO regarding the prosecution history and the words "essentially" and "one". Instead of repeating arguments, LGD refers to the corresponding section in its response to CMO on these issues.

2. *"formed on said second conductive layer and on a second portion of said first insulative layer overlying said first conductive layer" / "overlying"*

AUO's construction of overlying as covering the top surface is unduly limiting as neither the claims nor specification support such a construction. Contrary to AUO's assertions, the plain and ordinary meaning of "overlie" is "to lie over or upon." Exs. L-37, 38 (Merriam Webster's Collegiate Dictionary (1994) and The American Heritage Dictionary (1980)). In the context of the claims, overlying thus must mean over, *i.e.*, above. AUO's construction also interjects ambiguity as it does not describe how the surface must be "covered" (*e.g.* fully or partially).

AUO also asserts, without support, that "formed" means "produced." Produced offers no guidance as to the meaning of the term, however, and is inconsistent with the specification. The patent repeatedly refers to forming conductive layers. 2:37-40; 3:63-66; 5:6-8; 5:39-45.

D. U.S. Patent Nos. 5,905,274; 6,815,321; and 7,176,489 -- the "Single Photoresist Hillock Protection" patents

This family of patents is directed to an LCD with improved performance and yield that is manufactured with fewer process steps. Specifically, the improved design uses a low resistance gate layer, such as aluminum, that overcomes hillock problems that arise at the aluminum and gate insulating layer interface, by maintaining coverage, after etching, of a portion of the aluminum by another conductive layer, such as molybdenum. AUO ignores these fundamental principles in its attempt to read improper limitations into the claims. Rather, the terms should be

construed in light of the patent's teaching: preventing hillock at the sides exposed to the gate insulating layer, providing adequate gate insulator coverage, and reducing the contact resistance between the first and second metal layers.

1. "the first metal layer being wider than the second metal layer by about 1 to 4 µm" / "a total width of the first metal layer is greater than a total width of the second metal layer by about 1 to 4 µm"

AUO erroneously asserts that these terms are indefinite, or alternatively that the width should be "measured from a level defined by the top of the first metal layer," clearly ignoring the plain meaning of the claim language and the intrinsic evidence. Contrary to AUO's assertions, LGD's construction clarifies that the difference in width should be measured from the entire width of each layer, and includes the critical aspect that the sides must be exposed to the gate insulating layer. The language of the claims dictate that LGD's construction should be adopted.

The claims require that the first metal layer must be wider than the second metal layer or that a total width of the first metal layer is greater than a total width of the second metal layer. All parties agree that in view of the claims and specification there should be no difference in the construction for the claim elements that include "wider than" from the claim elements that include "total width." D.I. 376 (Ex. F at 8; Ex. G at 6; Ex. H at 5). AUO contends, however, that the *total width* and *wider* refer only to the narrower top of the layers. This contradicts the plain meaning. Wide and width are commonly understood to mean the extent from side to side. *See*, *e.g.*, Ex. L-40, Merriam Webster Collegiate Dictionary (1994) ("wide" defined as "having a specified extension from side to side"), ("width" defined as "the horizontal measurement taken at right angles to the length; breadth"); Ex. L-41, American Heritage Dictionary (1980) ("wide" defined as "having a specified extent of something from side to side; in width"), ("width" defined as "the measurement of the extent of something from side to side; the size of something in terms of wideness"); Ex. L-42, Riverside Webster's II New College Dictionary (1995)

("wide" defined as "having a specified extent from side to side"), ("width" defined as "the measurement of the extent of something from side to side"). The plain meaning of the claim thus mandates that the entire width should be measured or the extent from side to side of each layer.

The specification provides unequivocal support for LGD's construction as it sets forth that the first metal layer is equal to the width of the photoresist, and states that photoresist is patterned through exposure and development to have width w1, as shown in Fig 4A, on the second metal layer, thus unambiguously describing the original width of the photoresist. D.I. 384 at 22; 5:58-62. Then, the specification identifies that the first metal layer has the same width w1 as the photoresist. 6:5-6; 6:20-21. Thus, there can be no dispute that the width of the first metal layer is the original width of the photoresist. The intrinsic evidence provides further support for how one of ordinary skill would understand the width at the time of the invention. The figures from the cited prior art, U.S. Patent Nos. 5,132,745 and 5,156,986, demonstrate the width of the first metal layer has the width of the photoresist. See Exs. L-43 and L-44.

To try to create support for its construction, AUO incorrectly cites to statements in the prosecution history of U.S. Patent No. 6,573,127 ("the '127 patent"), an unrelated patent directed to the stresses exhibited by a first and second metal layer. AUO completely ignores that claim 1 of the '127 patent specifically requires that "the second metal layer is formed only on a portion of the first metal layer, leaving two side portions on a horizontal upper surface of the first metal layer having no second metal layer formed thereon." Ex. L-45 (the '127 patent, claim 1). This language is absent from the claims of the '274 family and thus supports that the '274 family should not be so limited.

AUO alleges that LGD's construction improperly imports "the subsequently deposited gate insulating layer." However, this language is necessary to clarify that the invention excludes

clad structure or oxide layers, as distinguished in the prosecution history. JX F1 (Response dated November 17, 1998). Further, the language is fully supported by the specification. 3:20-26 ("…the preferred embodiments of the present invention provide a thin-film transistor which prevents a hillock and deterioration of step coverage of a *later formed gate oxide layer on a double metal layer gate*."); 4:40-45 ("[t]he present inventors have discovered that a relationship between the width of the first metal layer and the width of the second metal layer of a double metal layer gate electrode is critical to preventing deterioration of step coverage *of a later formed gate oxide layer*…."); 4:60-63 ("[t]he first *insulating layer* 51 is preferably formed…on the substrate including the gate 49.") Finally, AUO's construction ignores the plain meaning of preventing hillock at the sides of the first aluminum layer. There is no basis to suggest that the aluminum on the sloped side portions would not experience hillock issues. LGD's construction unambiguously identifies how to measure the difference in width considering the entire area that would experience hillock.

2. *"the second metal layer being arranged on the first metal layer to prevent hillock at the sides of the aluminum first layer" / "at the sides of the aluminum first layer"*

LGD's proposed construction "the second metal layer is patterned to prevent hillock on the side surfaces of the first metal layer that are exposed to a subsequently deposited gate insulating layer" accurately reflects the teachings of the specification. AUO's contention that the sides should be limited to the lateral length of the exposed portions of the first metal layer is completely unwarranted because, as discussed above, hillock would just as likely occur on the side portions and cannot be disregarded. AUO's argument that LGD confuses width and thickness likewise has no validity. Accordingly, LGD's construction should be adopted.

3. *"double-layered structure" / "double-layered metal gate"*

AUO improperly seeks to limit the term to *only* two metal layers and a step structure.

LGD addressed AUO's improper limitation in its opening brief, pointing out that the claim language of the '274 patent is "*including* a double layered structure" and that the prosecution history supports additional layers can be included. See D.I. 384 at 23. AUO argues that the cited prior art references, *Wie* and *Miyago*, have "similar double step structures. However, the specification does not support importing these limitations into the claims. In contrast, LGD's construction focuses on an essential goal of the '274 patent, to reduce the contact resistance between the first and second metal layers. 3:30-34 ("[t]he preferred embodiments of the present invention further provide a method of fabricating a thin-film transistor that reduces the contact resistance between the first and second metal layers constituting a gate."); 2:60-65; 5:46-54.

4. *"gate"*

AUO asserts that all AUO and LGD patents should have the same construction for gate and gate electrode. This, however, would ignore the specifications of each individual patent. LGD asserts that terms should be construed in view of each individual patent. Here, gate should not be limited to only "a gate region" as asserted by AUO. The gate in the '274 clearly includes a portion of the gate lines as it is concerned with the wiring resistance. 1:17-19 ("[t]he gate of the thin-film transistor is made of aluminum to *reduce its wiring resistance*, but an aluminum gate may cause defects such as hillock"). LGD's construction accurately reflects that only a portion of the patterned material controls the current flow through the channel.

E. U.S. Patent No. 6,664,569 – the "Improved Picture Quality" patent

LGD's construes the terms of the '569 patent in view of the clear meaning set forth in the specification including the goals of reducing parasitic capacitance and compensating for misalignment. In contrast, AUO provides constructions that impermissibly narrow the claim scope with limitations that clearly ignore the teachings of the specification.

1. *"gate electrode" / "gate line"*

AUO blindly seeks to follow constructions from another patent without considering the claim language and disclosure of the '569 patent. In particular, the claims and specification of the '569 patent specifically disclose the gate electrode as part of the gate line. 5:47-48 ("The gate line 113 has a portion used for a gate electrode 115…"); 3:33-35 ("in contrast to the above-mentioned [prior art] array substrate, a gate electrode 41 is formed in the gate line 47; *see also, e.g.*, 4:28-30; 6:28-32; Figs 3-9. AUO, however, ignores these disclosures.

Further, AUO's construction creates ambiguity by introducing a "gate region" into the definition. As the specification describes that the gate electrode has an opening, such a construction makes it unclear whether the opening would be included in the gate region. 4:30-31; 4:48-50; 4:60-61; 5:49-51; 6:1-3; 6:30-32. Similarly, AUO's assertion that the "gate line" should be restricted to an "elongated directional conductor" is both overly limiting and ambiguous. AUO's reliance on the purported plain meaning of "line" as "a continuous length, straight or curved, without breadth or thickness" is clearly misplaced because the specification describes the gate line as having both breadth and thickness. *See* Figs. 1-9. AUO's construction also provides no guidance as to the meaning of the term gate line. LGD's construction, in contrast, properly construes "gate line" in view of the specification. 2:23-28; 6:21-28.

2. *"having an opening therein"*

AUO's proposed construction seeks to rewrite the claims in such a way as to limit them to the preferred embodiments. Nothing in the claim language or specification requires that the "opening" extend from the periphery to the interior of the gate line or gate electrode. Instead, the Court should adopt LGD's construction of the "opening" in the gate line or electrode as "a space in its pattern to reduce gate-drain capacitance and compensate for gate-drain layer misalignment." This construction does not import a functional limitation, as AUO claims, but

provides useful guidance as to the orientation of the opening in the gate layer with respect to the drain layer. The specification describes this orientation as critical to the invention. As previously discussed (D.I. 384 at 27-28), the opening minimizes the parasitic capacitance between the gate and drain electrodes by reducing the overlap between the gate electrode and the drain electrode, thereby improving the quality of the device, 8:65-9:6; *see also* 2:67-3:29; 4:6-11; 5:66-6:17; 7:41-59; 8:7-12, 24-28.

Even assuming *arguendo* that the claim terms do contain functional language (which LGD disputes), such a construction would not render LGD's construction improper because it provides guidance to the scope and meaning of the claim terms and is supported by the specification. *See Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313 (Fed. Cir. 2005)(stating "[i]t is therefore entirely proper to consider the functions of an invention in seeking to determine the meaning of particular claim language" and construing "substantially uniform magnetic field" as "a field that is sufficiently uniform *to obtain useful MRI images*").

3. *"the opening includes a first opening portion and a second opening portion"*

Once again, AUO improperly seeks to read limitations into the claim that excludes preferred embodiments. Figs. 7, 8. LGD's construction, in contrast, is fully consistent with the specification, which teaches different embodiments, each of which has different structural limitations, yet all of which have the same orientation between the gate and drain layers to achieve the goals of the invention. As described above regarding having the "opening therein" limitation, LGD's construction properly describes the orientation between the gate and drain layers in view of the specification. Accordingly, this Court should adopt LGD's construction.

4. *"a first electrode" / "a second electrode" / "a third electrode"*

AUO's proposed construction fails to address the relationship between the electrodes and

the opening and thus ignores the teachings of the specification and should be rejected. In contrast, LGD's construction of these terms, like its construction of the "opening" term above, provides the proper guidance regarding the scope of the terms in view of the specification, without importing unduly narrow structural limitations.

5. *"a semiconductor layer on the first insulating layer over at least a portion of the opening" / "a drain electrode on the semiconductor layer over at least a portion of the opening"*

AUO's characterization of LGD's constructions as unclear is unwarranted as LGD's construction clearly states that "a portion" of either the semiconductor layer or the drain electrode overlap the space in the gate line. Although AUO's construction tracks the claim language, it provides no guidance as to its meaning.

6. *"substantially surrounding the drain electrode"*

AUO's construction erroneously relies on a dictionary definition that contradicts the clear meaning in the specification. As discussed in LGD's opening brief, Figs. 5, 6B, 6C, 7-8 depict the source electrode surrounding a considerable amount, but not almost all, of the drain electrode and thus supports LGD's construction. *See also* 5:59-61; 7:1-2; 8:5-6.

F. USP 6,803,984 – the "Serial Production Line" patent

1. *"on a single production process line"*

AUO admits that its proposed construction reflects "the spatial arrangement" of "a linear arrangement." (D.I. 387 at 54.) AUO's focus on a geometrical understanding of the word "line," however, ignores the claim language "*production process* line," which denotes "an arrangement of operations in manufacturing permitting sequential occurrence on various stages of production." Ex. L-15(a) (Merriam-Webster (1994) at 677 (definition of "line")). AUO also improperly relies on the "single line" language in the specification to support this "linear" limitation, despite the fact that this language ("single line") refers to a serial production process

line, as opposed to parallel production process lines.[2] 5:23-30.

LGD's construction does not read on parallel production lines, as AUO suggests. (D.I. 378 at 55.) Instead, AUO's hypothetical scenario entails substrates passing through multiple paths, which is contrary to the claim language, the stated objective of the invention, and LGD's constructions. Further, the applicant did not cede any claim scope when addressing prior art reference JP 8-171076. (D.I. 378 at 55.) The applicant remarked that "JP076 teaches that parallel processing is carried out on each distinguished substrate with separate lines when distinct processes are desired . . . ," clarifying that a parallel production process lines, in lieu of the claimed common path, can be used to perform processes distinct to each substrate. The applicant did not remark, as AUO suggests, that the claimed process line must consist of a "linear arrangement" of machines.

Consistent with the specification, LGD proposes a construction of "on a production line where the processing equipment is arranged along a common path for performing the liquid crystal cell processes." D.I. 384 at 34. The term "common path" simply reflects the inherent fact that "portions" of a production line must have a path for conveyance of materials. *See Datapoint Corp. v. Std. Microsystems Corp.*, 31 Fed. Appx. 685, 691 (Fed. Cir. 2002) (holding that construction requiring that each node "hear" every communication is proper because it reflects inherent fact that each node must "hear" a communication before it can "recognize and accept only those transmissions addressed to it"). Further, rather than a linear arrangement of machines, the patent claims a sequence of "steps" and "portions," ordered to maximize spatial efficiency and improve productivity. 3:52-53. Although LGD agrees that the claimed

[2] Notably, the definition of "production line" relied upon by AUO does not require that the processing equipment be in a "linear arrangement." (D.I. 378 at 54, n.32.)

production line has a "single arrangement," in that the processing equipment on the production line is arranged along a common path (contrasted with parallel production lines), LGD does not agree that "single arrangement" refers to the machinery itself. Rather, as is evident from the specification, the term refers to a single sequence or arrangement of "portions" or "steps."

2. *"passing the first and second substrates through a sealing material coating portion of the single production process line in serial order"*

The "sealing material coating portion" is not, as AUO recommends, limited to an "equipment / machine for coating sealing material." When the inventors meant to claim use of "equipment / machine," they used the word "unit." Claim 10 ("cleaning unit"); claim 19 ("rubbing unit"); claim 20 ("cutting unit"). Considering the claim language provides for a "sealing material coating *portion*," rather than a "sealing material coating *unit*," there is no basis for AUO's limiting construction.

Further, the intrinsic record does not limit the structure and performance of the processing equipment such that a substrate must enter "at one end" and exit "at the other end" as AUO urges. (D.I. 378 at 56.) In fact, the claims and specification acknowledge that the processing equipment of the sealing material coating portion, for example, must coat sealing material on one substrate but not the other. 7:62-67. Although the claims require that the substrates pass through the "portion" of the single production process line, this should not be construed to mean the depositing equipment itself. *Id.* Implementing AUO's vision of the claimed production line would actually hinder, rather than promote, efficiency. 3:51-53.

Lastly, although LGD agrees that "serial order" means "one after the other," LGD does not agree with AUO's caveat, "without anything in between." The "without anything in between" limitation is not supported by the intrinsic record and does not reflect the ordinary meaning of "serial order." The claims only require that the substrates pass through the

production line "in serial order." In the absence of any basis to read a negative limitation into a term otherwise directed to the sequence of steps (rather than the substance thereof), the Court should reject AUO's overly narrow and limiting construction.

G. U.S. Patent No. 7,218,374 – the "ODF Seal" patent

1. *"forming a main sealant" / "main sealant"*

LGD and AUO agree on a key portion of these limitations, namely that the "main sealant" serves to "enclose." LGD does not agree, however, with other aspects of AUO's construction. First, a "segment," as advanced by AUO, may permit multiple separate segments of sealant (D.I. 378 at 58-59), and is contrary to the patent. 5:5-7; Figs. 3B, 4A, and 5A. Multiple segments of sealant, even if adjacent, would reintroduce the problem of excess sealant and contamination addressed by the claimed invention. Second, requiring the main sealant material to "enclose the liquid crystal" is inaccurate. The claim language does not specify *when* the liquid crystal must be deposited inside of the main sealant. Instead, the claim only requires that the main sealant enclose a place where the liquid crystal is to be deposited, *i.e.*, the display area. Consider Fig. 3B, which denotes the main sealant being formed on one substrate and the liquid crystal being deposited on another. *See also* 2:47-50 (recognizing the seal separates the "active region (central part of the substrate)" and the "dummy region (outer part of the substrate)." Third, AUO does not propose a construction for "forming." Instead, AUO's proposed construction is "forming a segment of sealant that encloses the liquid crystal in the LCD panel." As is evidenced by the specification, however, the '374 patent addresses one-drop fill technology, that requires the sealant to be deposited, rather than screen printing or other technologies that do not. 2:36-40; Fig. 2B.

2. *"a dummy region"*

AUO's proposed construction for "dummy region" is incorrect, in that it arguably

requires that the main sealant be formed in the dummy region. The specification, however, repeatedly states that the "auxiliary sealant," rather than the "main sealant," is formed in the dummy region. 2:50-54; 5:3-5; 9-14. Consequently, LGD's construction should be adopted.

3. *"auxiliary sealant"*

AUO's construction improperly suggests that the main sealant is formed prior to the auxiliary sealant. The word "extend" is commonly defined as "to cause to reach (as in distance or scope)." Ex. L-48. Merriam-Webster's Collegiate Dictionary (1994). The patent plainly provides, however, that "the auxiliary sealant is formed in a dummy region and connects to the main sealant." Claim 1. While AUO and LGD agree that "contiguous" means that the auxiliary and main sealants are applied continuously, *i.e*, no break in the process, AUO fails to recognize that the process begins with the auxiliary sealant, not the main sealant. Moreover, depositing the main sealant first is inconsistent with one of the main objectives of the invention, which is to prevent contamination of the liquid crystal caused by contact with the sealant material. 2:50-54; 5:27-29; Fig. 3B.

II. CONSTRUCTION OF DISPUTED CLAIM TERMS OF THE AUO PATENTS

A. U.S. Patent No. 6,976,781 – the "Hooks and Holes Connector" patent

As explained in the patent, the approach described for attaching the frame and bezel of a backlight balances between ease of disassembly and structural strength. 2:20-32. The disassembly feature results from the relative ease of bending either a plastic or metal structure, *e.g.*, a frame, outwardly to disengage the holes in its side from hooks protruding from the underlying structure, *e.g.*, a bezel. *See* 1:64-2:20. AUO's constructions disregard these important aspects of the claimed invention.

1. *"on outer surfaces of said first edge a plurality of first hooks are formed to protrude outwardly"*

AUO's proposed construction is defective as it proposes an overly broad interpretation for "hook" and fails to provide any guidance for the remainder of the limitation. With respect to "hook," AUO suggests that it means "any protruding structure intended to be inserted into a hole for the purpose of fastening one element to another." This construction is overly broad as it could include separate structures, such as screws, which is inconsistent with the patent. For example, the limitation in context with the remainder of the claim requires that the hooks ***are formed*** on outer surfaces to protrude outwardly. Consequently, the hooks are formed as part of the edge from which they protrude. Further, the specification consistently describes hooks as being "formed" on, "fabricated" on, or otherwise located "on" the outer surfaces of the frame or bezel. 2:35-37, 40-41; 3:11-13, 18-20, 34-35, 39-40, 57, 60-64; 4:1-5, 15-18, 26-27. Likewise, AUO's construction ignores that the "prime objective of the ***present invention*** is to provide a new assembling manner of the backlight unit for obtaining the both advantages [sic] of ***disassembling convenience*** and increasing structure strength." 2:29-32. (emphasis added). The specification clearly explains that the disassembly problem relates to the difficulty of, for example, "pressing slightly the hooks of the bezel and pulling the long edges of the frame." 3:49-54. If the hooks could be disengaged separately, such as by removing screws, the disassembly issue described in the patent would never arise. Hooks cannot properly include separate components, such as screws and, therefore, AUO's construction should be rejected.

2. *"as said frame is mounted onto said bezel" / "simultaneously said second edge is disposed onto . . . second sidewall, and said first hooks are inserted and engaged in said second holes"*

Once again, AUO's construction of these terms ignores the very language of the claims. The claims plainly require that the hooks be inserted into and engage the corresponding holes at

the same time that the frame is mounted onto the bezel. Essentially, the frame and bezel are snapped together so that the hooks engage the holes at the same time the frame is mounted onto the bezel. In fact, it is this snapping together of hooks and holes that results in the disassembly issue discussed above. LGD's construction *does not require*, as AUO contends, that "the mating of the hooks and holes of all the edges and sidewalls must occur at the exact 'same time'." (D.I. 378 at 4.) Instead, LGD's construction requires that, because the hooks are formed to protrude outwardly from a sidewall, *e.g.*, of a frame, those hooks are inserted into and engage corresponding holes, *e.g.*, of a bezel, when the frame is mounted, or snapped, onto the bezel. Further, this construction does not improperly read a process limitation into an apparatus claim as AUO contends. (D.I. 378 at 4-5.) Rather, LGD's construction follows directly from the claim language itself. The "at the same time" or "simultaneous" requirements, which AUO all but ignores in its construction, can be accomplished only by forming the hooks as part of the frame and bezel components. AUO's construction should be rejected, as it would improperly include the use of screws as hooks to mount the frame to the bezel.

3. *"bezel"*

AUO's attempt to construe "bezel" broadly to include a front or back frame is also contrary to the claims and specification. Both claims 1 and 8 recite the "bezel" and "frame" as separate components, which are made of different materials and have different (but complementary) patterns of hooks and holes with which to engage each other. 4:53-61; 5:36-6:9. Likewise, the specification repeatedly describes and shows the bezel as the outermost back cover and not simply as any frame. The "Background of the Invention," for example, explains:

> the typical backlight unit **10** applied to the LCDs comprises a lightguide plate **100**, optical films **102**, a reflector sheet **104**, a tubular lamp **106**, a frame **108** and a ***backbezel 110***. The frame and ***bezel 110*** are assembled together to contain and fabricate above components.

1:30-43 (emphasis added). The specification similarly describes the invention as including "a frame 200 and a bezel 210," on which a number of components are assembled and then "the frame 200 is mounted onto the bezel 210 to contain those components." 3:6-31. Moreover, all of the figures show the bezel as the outermost back cover for the backlight module. Figs. 1-5.

There is also no support for AUO's argument that the specification distinguishes a "backbezel" (or back cover) from the term "bezel." The specification uses both terms "bezel" and "backbezel" to refer to the same component 110 in Figure 1. *E.g.*, 1:33. In fact, the specification refers to the "backbezel 110" only once, but refers to the "bezel 110" *thirteen times*. *E,g.*, 1:33, 36, 43, 45, 47, 49, 52, 53, 66; 2:3. This demonstrates that the bezel is intended to be the outermost back cover. The specification nowhere suggests that "bezel" should be construed more broadly than "backbezel."

B. U.S. Patent No. 7,101,069 – the "Elongated Lamp Support" patent

The parties agree that the elongated lamp support must simultaneously support an illumination tube and the diffuser, but dispute what constitutes supporting the illumination tube.

1. *"fitting portion"*

AUO's construction for supporting the illumination tube is only that the fitting portion must ***accommodate*** the tube. This does not clearly define the claim scope and results in ambiguity. AUO's reference to the specification to justify its "accommodating an illumination tube" construction is incomplete. D.I. 378 at 5. As recited in the specification:

> In addition, the fitting portion **142** is a ***circular hole*** for accommodating the illumination tube **130**. The diameter of the fitting portion **142** is ***substantially equal*** to that of the illumination tube **130**. Further, the second minor gap G**2** between the fitting portion **142** of the support **140** and the illumination tube **130** protects the illumination tube **130** from deformation due to thermal expansion and contraction of the support **140**.

2:62-3:2 (emphasis added). As described in the patent for this embodiment, the fitting portion is

a ***circular hole*** that accommodates the tube. Consequently, the fitting portion structure surrounds the illumination tube, and therefore, ***holds*** it. Further, the diameter of the hole is ***substantially equal*** to the diameter of the illumination tube -- again acknowledging that the fitting portion ***holds*** the illumination tube. AUO argues that because of a "gap" between the fitting portion and the illumination tube, the fitting portion could not "hold" the tube. (D.I. 378 at 6.) Again, AUO misinterprets the specification. As explained in the patent, the "minor gap" between sidewalls of the fitting portion and the illumination tube is sized to protect the illumination tube from thermal expansion and contraction of the support. *See also* claim 2; 2:50-54. AUO improperly interprets LGD's proposed construction of "hold" as "rigidly hold" or "tightly hold." Instead, LGD's construction reflects the disclosure in the specification and avoids the ambiguity inherent in AUO's proposed interpretation.

2. *"comprises two sidewalls extending upwardly and separately"* and *"has two sidewalls extending upwardly and separately"*

AUO incorrectly contends the language "comprises two sidewalls" in claim 1 allows the fitting portion to have more than two sidewalls. The phrases "comprises two sidewalls" and "has two sidewalls" in claims 1 and 16, respectively, both mean that the fitting portion includes two sidewalls, not at least two sidewalls. The word "comprising" only refers to the total number of elements in the fitting portion, allowing the fitting portion to have additional elements besides the recited two side walls, at least one of which extends beyond the top of the illumination tube. *See Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271 (Fed. Cir. 1986) a step which recites engaging "eight cube pieces as a composite cube" does not read on a step which engages more than eight cube pieces, despite the use of the transitional term "comprising")*; see also Spectrum Int'l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1379 (Fed. Cir. 1998). Moreover, the sidewalls are "upright structures" because they are claimed as "extending upwardly" and shown

by all of the embodiments in the patent. Figs. 3-5G.

C. U.S. Patent 7,125,157 - the "Optical Film Positioning" patent

AUO's proposed constructions for "supporting portion" and "constraining portion" ignore the context of these limitations as explained in the patent. AUO concedes that first and second supporting portions "alternate supporting the optical film depending upon the orientation of the LCD." (D.I. 378 at 6.) AUO further acknowledges that when in the first position, the first supporting portion provides the ***sole support*** for the optical film and the second supporting portion does not even contact the film. *Id*. at 6-7. Conversely, when rotated to a second position, the second supporting portion provides the ***sole support*** for the film and the first supporting portion ceases to contact the optical film. AUO's proposed constructions, however, do not reflect these points. *See Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) ("Proper claim construction, however, demands interpretation of the entire claim in context, not a single element in isolation.")

The patent also explains that the "supporting portion" when supporting the film could not be located away from the top of the LCD. Describing a prior art design with an improved structure for retaining optical films, shown in Fig. 1B, the patent explained that if the supporting portion supporting the film were rotated away from the top, the weight of the optical film would concentrate stress on the supporting portion resulting in Mura defects and uneven optical efficiency. 1:52-2:8. To avoid these problems, the *first supporting portion* necessarily must be located along an upper edge when in the *first position*. This avoids undue stress on the supporting portion. If the supporting portion were located away from the upper edge when supporting the film, excessive stress could cause undesired optical defects. Indeed, all of the embodiments and figures disclosed in the specification show the optical film being supported by a supporting portion positioned along an upper edge. Figs. 3A (element P_1); 3B (element P_2); 3C

(elements P_1, P_3, P_5); 4A (elements P_1', P_2', P_3'); 4B (elements P_4', P_5'); 4C (elements P_1'', P_2'', P_3''); 4D (elements P_4'', P_5'').

The patent explains that each constraining portion must have a space between its respective supporting portion and a constraining portion edge to allow for thermal expansion and contraction of the optical film. In the first position, the optical film rests on the first supporting portion with a gap *below* the first supporting portion. When in the second position, the first supporting portion does not contact the film. To avoid contact, gaps must exist *above and below* the first supporting portion to allow for expansion and contraction of the film. As shown in Fig. 3B, when rotated 180 degrees from the first position, there is a gap above and below the first supporting portion P_1 and the first supporting portion no longer contacts the first constraining portion H_1. Similarly, in the second position, the optical film rests on the second supporting portion with a gap *below* the second supporting portion; whereas in the first position, there is a gap *above and below* the second supporting portion. 5:37-39; 6:22-25; 6:47-49; Figs 3A-4D.

1. *"supporting portion"*

AUO argues that the word "projection" in LGD's construction is too narrow because a projection "may be defined to have a specific shape." (D.I. 378 at 7.) This assertion is inconsistent with the ordinary usage of the term. AUO's construction fails to address in context *when* the supporting portion is intended to support the optical frame. *See Hockerson-Halberstadt*, 183 F.3d at 1374. It is improper to construe "supporting portion" alone because the ***first*** and ***second*** supporting portions cannot simultaneously perform the same function. As discussed above, only one or the other supporting portion provides support at any given time. Contrary to AUO's assertion, LGD's construction is not shape-specific and reflects the context of the claims.

2. *"constraining portion"*

Contrary to the patent, AUO's construction improperly allows for both the first and

second constraining portions simultaneously to contact and restrict movement of the optical film. As above, the term should be construed in the context of "first constraining portion" and "second constraining portion." The first and second constraining portions cannot simultaneously restrict movement of the optical film. According to the claims and specification, the first constraining portion is only intended to restrict movement of the film in the first position, and the second constraining portion is only intended to restrict movement of the optical film in the second position. 5:37-39; 6:22-25; 6:47-49; Figs. 3A-4D.

Further, the constraining portion must have a gap in the gravity acting direction -- which simply refers to the direction toward which the films would fall without any support. The gap that exists in this direction is inherent in the claims and thus cannot be repudiated under the doctrine of claim differentiation as AUO contends. *See Thorn EMI N. Am. v. Intel Corp.*, 928 F. Supp. 449, 459, 466 (D. Del. 1996) (reasoning that doctrine of claim differentiation did not prevent construing independent claims to require a limitation of a dependent claim because the limitation should be deemed present in all of the claims). The gaps within the constraining portion are necessarily present according to independent claims 1 and 16 for two reasons: (1) when the supporting portion "does not contact" the constraining portion (*i.e.*, optical film is not resting on the supporting portion), there ***must be a gap*** above and below the supporting portion, and (2) when the same constraining portion is contacted by the supporting portion when the LCD is in another position, there ***must*** be a gap below the supporting portion and not above the supporting portion because the optical film is resting on the supporting portion.

Finally, AUO's objection to the language "a passage through the film" is misplaced. A "groove," according to the specification and figures, is clearly an opening or channel in the film and not simply a depression. See Figs. 1, 2, 3, 4.

3. *"first position"* and *"second position"*

AUO's construction for "first position" as "an initial position" is meaningless and ignores that the first position directly relates to the location of the first supporting portion. As discussed above, the specification confirms that the LCD is in an initial or first position when the first supporting portion is located near an upper edge of the LCD. To prevent Mura defects, the first supporting portion must be located along an upper edge of the LCD in the first position. If the first supporting portion is located elsewhere when in the first position, undue stress would concentrate at the first supporting portion due to the weight of the optical film and could cause optical defects. Moreover, all of the embodiments and figures show the optical film being supported by a supporting portion positioned along the upper edge.

D. U.S. Patent No. 6,689,629 – the "Dummy Etching Patterns" patent

AUO recognizes this patent is directed to etching conductive material deposited on a substrate and seeks to avoid "undercut" of this conductive layer caused during etching. (D.I. 378 at 9.) As further acknowledged by AUO, the approach described in the patent to solve this problem is by increasing the conductive layer's pattern density by adding dummy conductive patterns in specific locations on the substrate. *Id.* It is within this context that LGD proposes its constructions. AUO misinterprets LGD's proposed constructions as requiring the wiring and dummy conductive patterns to be part of the substrate. To the contrary, LGD's constructions explain that there is a conductive layer *on* the insulating substrate, that the conductive layer covers an area defined by the patterned conductive material on the substrate, and that the wirings and dummy conductive patterns are made of this conductive layer. In contrast, AUO proffers claim constructions that provide no understanding as to the proper scope of the claims, rendering them indefinite.

1. *"a layer of an insulating substrate, having an area" / "area"*

AUO suggests that "area" means simply "a specified region," which ignores the context of the claim, the patent description, and provides no guidance on the scope of the claimed invention. AUO's definition only supports LGD's position that the term "area" is ambiguous and, thus, indefinite. AUO cannot point to any evidence that explains how one of skill could determine what region is "specified." With AUO's construction, there is no way to distinguish one specified region from another to determine whether or not the area is covered by the claim limitation. Any area, of any size or location on the substrate, could be the "specified region."[3]

LGD contends that the proper construction should be in view of the first limitation, "a layer of an insulating substrate, having an area," and should be "material deposited and patterned on a substrate, such as glass, that covers part of the array substrate surface." (D.I. 384 at 47-49.) AUO incorrectly contends that LGD's proposed definition requires the wirings and dummy patterns be part of the insulating substrate. In actuality, LGD's construction accurately defines the layer to be *on* the insulating substrate. According to AUO, there would be no difference between "an insulating substrate" and "a layer of an insulating substrate." This construction, however, would be contrary to the plain language of the claim as well as the specification. Nowhere does the specification support that layer refers to the substrate itself. 1:39-42; 2:16-18; 4:39-40. To the contrary, the patent consistently refers to a layer as being a conductive layer

[3] Claims 1 and 9 would be invalid, following this construction, in view of U.S. Patent No. 5,285,301 ("*Shirahashi*"). In Office Action dated May 29, 2003, the Examiner rejected originally filed claim 1 citing *Shirahashi* for all elements including having dummy patterns between the pads and the pixel electrodes. JX K1. However, the Examiner identified originally filed claim 2, which required that the dummy patterns comprise 30% of the area, as allowable subject matter. As *Shirahashi* discloses solid dummy patterns between the pads and pixel electrodes, Ex. L-49 (U.S. Patent No. 5,285,301), AUO's construction of "specified region" could be any area where the solid dummy patterns are located thus invalidating the patent.

formed on the substrate. *See, e.g.*, 5:38-42 ("[e]ach of these dummy conductive patterns 29 can be formed as a two-layers structure with the same materials as those of the scan lines 23 and signal lines 24 at the same time when the patterning is performed therfor"); claims 2-8, 10-16 (including various requirements for upper or lower layer conductive materials for the wirings). Finally, AUO's construction ignores the critical link between the dummy patterns and wirings to achieve the desired taper shape and avoid undercut.

2. *"dummy conductive patterns" / "plurality of wiring arranged on the insulating substrate"*

AUO's arguments regarding LGD's constructions improperly rely on AUO's incorrect assertion that the layer identified in the first element must be the substrate itself. As discussed above, this argument is fundamentally flawed and should be rejected.

3. *"dummy patterns comprising at least about 30% of the area of the insulating substrate, the dummy conductive patterns situated between the connection pads and the pixel electrodes"*

With AUO's proposed constructions, not only is "area" ambiguous, but the "at least about 30% of the area" limitation is meaningless. AUO's logic allows the region to be defined by where dummy patterns are located, and the size of the region to be determined by when the 30% density threshold is met. Further, any single solid pattern, such as those disclosed in the prior art *Shirahashi*, would satisfy the 30% requirement. AUO ignores that the essential goal of the invention is to "form good wiring over the entire surface of the array substrate." 5:34-36.

E. U.S. Patent No. 6,778,160 – the "Ideal Brightness Determinator" patent

AUO improperly seeks to broaden the scope of this patent by characterizing it as simply "a method for 'inhibiting flicker….' by applying an excess amount of pixel driving voltage, or "overdriving," the liquid crystals ("LC") display elements of the display." (D.I. 378 at 13.) Instead of addressing overdriving, this patent describes modulating video signals to achieve the

output of an ideal quantity of light, taking into account the actual response time of the liquid crystal material. This method cannot be characterized as broadly applying an excess amount of pixel driving voltage or overdriving. 4:42-47; 5:15-21; 5:66-6:06; 9:11-25; Figs. 4, 6; Abstract.[4]

The parties primarily disagree on two fundamental issues: (1) whether determining an output brightness level requires applying an offset, which is predetermined by taking into account the response characteristics of the liquid crystal cell, to the next brightness level "so as to make a time integration quantity of a brightness change substantially equal to an ideal quantity of light," and (2) how to obtain the difference between the "time integration quantity of a brightness change" and the "ideal quantity of light in a stationary state."

1. *"so as to make a time integration quantity of a brightness change substantially equal to an ideal quantity of light in a stationary state with respect to the next brightness level"* (claim 1)

The construction of this term concerns one of the critical disputes between the parties: how to interpret term portions "time integration quantity of a brightness change" and "ideal quantity of light in a stationary state." AUO contends that "time integration quantity of a brightness change" should mean "a quantity of light equal to the actual brightness level output through a liquid crystal, summed over the rise and fall response time of the liquid crystal," stating that "[t]he plain meaning of integration, in this context, is summing a changing value

[4] As illustrated in Figs. 2, 7, 8, when the brightness level of the video signal changes from 0 to 100 % or vice versa, there is no overdriving to the next video signal because the moving state (actual) response characteristic is the same as the stationary (ideal) response characteristic. In addition, when the response time of a liquid crystal is so slow that the quantity of light of the actual response characteristic is almost the same as the quantity of light of the ideal response characteristic, no overdriving is needed. (See Model A in Figs. 3 and 5(a).). In other words, if the actual quantity of light emitted from the liquid crystal cell is greater than the ideal quantity, a lower driving voltage should be applied to the liquid crystal cell, thus, no overdriving is utilized.

(here, brightness level) over a period of time (here, the response time of the crystal)." (D.I. 378 at 17.) There are two problems with AUO's definition.

First, it does not specify the duration for which the next brightness level of the next video signal is applied to the liquid crystal cell to obtain the rise response time. According to the patent, the duration is one frame interval, which is a time increment in which all the images (picture elements) form one complete picture on the LCD device. 1:43-45; Figs. 4, 5, 6. LGD's construction properly includes the duration as "during the next time increment."

Second, neither the brightness level nor the duration of the video signal is specified by AUO after applying the voltage level corresponding to the next brightness level to obtain the fall response time. In order to obtain the fall response time, a voltage level corresponding to either the previous brightness level or "off-state" level of the video signal should be applied after applying the voltage level corresponding to the next brightness level to the liquid crystal cell. AUO's construction fails to specify this brightness level while LGD's construction properly identifies the "previous brightness level" in its construction."[5] Further, because the fall response time may be longer than one frame interval depending on the type of liquid crystal, as illustrated in Figure 5(a), the definition of the disputed term should specify the duration of the applied voltage to include one frame after applying the voltage level corresponding to the next brightness level. LGD's construction appropriately includes "before and after the next time increment." Accordingly, because the response time of the liquid crystal depend on applied voltages (or

[5] To the extent claim 1 covers a change in brightness from one medium brightness level to another, LGD contends that the term "time integration quantity of a brightness change" is indefinite because the specification only refers to the application of an "off-state" voltage level to obtain the fall response time. 5:66-6:03; Figs. 5-6; Eccles Decl. ¶ 6.

brightness levels) as well as the durations for which the voltages are applied, the Court should reject AUO's construction.

With respect to the terms "ideal quantity of light in a stationary state" and "ideal light quantity which is the brightness in a stationary state," AUO incorrectly contends that a portion of LGD's construction, "when the liquid crystal cell is provided with the next brightness level during the next time increment and the previous brightness level before and after the next time increment," imports an unnecessary limitation. However, that portion of LGD's construction differentiates between the ideal and actual response characteristic of the liquid crystal -- which is the difference between the terms "time integration of a brightness change" and "ideal quantity of light in a stationary state." AUO inexplicably chooses a portion of the definition in the specification to define "substantially equal." The Court should reject this approach.

2. *"determinator for determining an output brightness level"*

Another critical dispute between the parties is whether determining an output brightness level requires applying a predetermined offset, by taking into account the response characteristics of the liquid crystal cell, to the next brightness level. AUO incorrectly suggests that LGD lacks intrinsic support for this interpretation. (D.I. 378 at 16.) AUO, however, ignores the repeated references in the specification and prosecution history to the predetermined offset. (D.I. 384 at 60); 4:61-67; 4:42-47; 5:15-21; 5:66-6:06; 9:11-25; Figs. 4, 6; JX M-1 (App. 09/760, 131; 12:/22/2003, Appeal Brief); 10:49-52; and Figs. 1, 7.

Moreover, applying an offset, which is predetermined by taking into account the response characteristics of the liquid crystal cell, is prerequisite "so as to make a time integration quantity of a brightness change substantially equal to an ideal quantity of light" for enablement purposes. 35 U.S.C. § 112 ¶ 1; Eccles Decl. ¶¶ 4-5. The disputed term "an offset for making the time integration quantity of a brightness change substantially equal to an ideal light quantity which is

the brightness in a stationary state to said second brightness information" should be construed in this context.

3. *"brightness level"*

AUO attempts to support its interpretation of brightness level by suggesting that the construction "a level of intensity of light" is consistent with a portion of the specification stating brightness "should be considered in terms of the quantity of light" ('160 Patent at 8:32-35), *i.e.*, the intensity of light." AUO miscites the specification and effectively treats the term "intensity of light" the same as the term "quantity of light." As discussed with respect to the term "time integration quantity of a brightness change," the term "quantity of light" is an integrated value of changes in brightness level over time. Thus, these two terms have different meanings. AUO's cited portion of the specification simply means that because humans perceive images based on the quantity of light, instead of a specified brightness level.

Although AUO concedes that the specification indicates that a "brightness level can be represented as a target brightness value by a gray scale," 4:47-49, AUO still tries to argue that LGD's definition imports an improper limitation. To the contrary, because gray scale value in the "RGB" system and luminance value in the "YUV" system are the ones that are carried and modulated by electronic circuits or logic for displaying images, LGD clarifies the boundaries of the claims in context, as opposed to AUO's abstract concept of "a level of intensity of light."

AUO also contends that the term "brightness" should not be used to denote the concept of "luminance," referring to the IEEE. LGD's construction includes "luminance value", along with "gray scale value," because of the disclosures in the patent itself at 5:15-17 that display systems other than the "RGB" system can also be used. If AUO wishes to exclude the display systems using luminance value for brightness level from the scope of the claims, the Court should adopt only the "gray scale value" of LGD's proposed construction.

4. *"a storage for storing the previous brightness level of the video signal input through said input logic"* and *"the next brightness level of the next video signal input to said input logic"*

AUO ignores claim 1 by suggesting that LGD's constructions for these terms "include[s] unnecessary limitations such as "received from a host." D.I. 378 at 15-16. Claim 1 makes clear that the previous brightness level is the brightness level of the video signal received from the host through input logic during the previous frame time, and that the next brightness level is the brightness level of the video signal received from the host through input logic during the next frame time. 11:21-35. In addition, all the embodiments and figures confirm that the previous brightness stored and the next brightness level compared before compensation are from the host such as computers. In particular, the patent at 6:66-7:16 and Figure 1 discloses that "[t]he I/F board 20 comprises a input unit 27 for inputting a video data ***from a host*** such as a PC/WS system, a comparison logic 24 for comparing the previous brightness with the next brightness ***for an input video signal***…." [6] (Emphasis added.)

With respect to the disputed term "frame buffer," AUO contends that because claim 12 only requires the frame buffer to store "first brightness information for an input pixel," LGD's construction should not be adopted. (D.I. 378 at 14.) AUO's argument ignores the accepted meaning of "frame buffer" in the LCD industry and the explicit definition of "frame" in the specification. 1:43-45. Thus, the frame buffer must store a plurality of brightness levels that form one complete picture on the liquid crystal display.

[6] The disputed terms "first brightness information for an input pixel" and "second brightness information for the next input pixel" should be construed in a similar context. The parties agree that "brightness information" refers to "brightness level." (D.I. 378 at 15, fn. 5.)

5. "video signal"

AUO disputes LGD's construction of "a signal carrying a brightness level from a predetermined range" with its stock response that this construction includes "unnecessary limitations." AUO again ignores the language of claim 1, which makes clear that the video signal carries a brightness level. 11:23-28 ("previous brightness level of video signal" and "next brightness level of the next video signal"). This is further supported by all the embodiments and figures of the patent. The brightness level of the video signal must also be from a predetermined range of brightness levels, not an arbitrary level. *E.g.*, Figs. 2, 7, 8, 9.

6. "image display cell" and "pixel"

AUO's arguments relating to these terms again ignore the preferred embodiment. As illustrated in Figs. 2, 7, 8, when the brightness level of the video signal changes, for example, from 0 to 100%, or vice versa, there is no overdriving to the next video signal because the moving state (actual) response characteristic is the same as the stationary (ideal) response characteristic. Thus, to read these terms in the context of the patent, a proper construction of both must include "that has the ideal response characteristic at the maximum brightness change."

F. U.S. Patent No. 7,090,506 – the "Touch Screen Connector" patent

AUO's proposed constructions of the terms "display module," "hot bar soldering," and "flexible printed circuit board" are vague and ambiguous, as they depart from the ordinary meaning of the terms and ignore the context in which they are used in the patent.

1. *"display module"*

AUO's construction of "display module" as "an LCD module" ignores the very context in which the term is used in the claims and specification. *Hockerson-Halberstadt, Inc.*, 183 F.3d at 1374. Nowhere does the specification refer to the display module as a general LCD without a touch screen, nor does it describe the invention as broadly covering all LCD modules, regardless

of whether or not they include a touch screen.

Instead, the specification consistently uses the term "display module" to refer to a touch screen display module, which includes an LCD panel, a touch panel, and a light source. For example, the specification describes the invention as an improvement over "the conventional touchscreen LCD module" which, at the time of the patent, required multiple connectors to communicate signals between the module and the system. 1:12-21. Moreover, all of the embodiments refer to the display module as a "touchscreen display module," or include "touch panel signals" among the signals transmitted between the module and the system. 1:61-2:12; 2:58-64; 3:2-4; Figs. 1 and 2 (element 10). The claims "must be read in view of the specification, of which they are a part." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005). LGD's construction of "display module" as "an assembly that includes an LCD panel, a touch panel and a light source" is entirely consistent with the specification and should be adopted.

2. *"hot bar soldering"*

The only objection AUO raises to LGD's proposed construction relates to the "pressure" requirement. This objection is a non-issue, given that both parties agree that hot bar soldering requires holding together the two circuit boards under pressure. (D.I. 378 at 21.) Both parties agree that "hot bar soldering" refers to a specific process, which is distinct from other forms of soldering. Yet, AUO's construction for "hot bar soldering" is overly broad because it could include regular soldering by broadly referring to heating an undefined "contact area" with a bar. Hot bar soldering requires soldering *multiple points simultaneously* while applying pressure to the parts being soldered. AUO disclaimed regular soldering during prosecution when it distinguished the prior art *Shibata* reference, which discloses joining two flexible printed circuit boards by regular soldering. In particular, AUO repeatedly emphasized that the circuit boards in *Shibata* are not "joined by hot bar soldering." JX O-1 (App. 10/921,462, 05/10/06, Amendment,

pp. 10-11). Thus, AUO cannot now argue that hot bar soldering covers regular soldering. *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) ("[e]xplicit arguments made during prosecution to overcome prior art can lead to narrow claim interpretations . . . ."). LGD's construction of "hot bar soldering," however, properly takes into account the unique nature of that process.

3. *"flexible printed circuit board"*

Contrary to its representations, AUO's proposed construction of "flexible printed circuit board" is the one that is vague and ambiguous. Under AUO's construction, it is unclear whether the printed circuit must be made entirely on a flexible film or may be made only partly on a flexible film. For example, AUO's construction arguably allows the "flexible printed circuit board" to be printed on a combination of a flexible film attached to a rigid circuit board. Yet, there is no support in the intrinsic record for such an expansive reading of the term flexible printed circuit board. Rather, the figures and embodiments of the patent consistently shows that the "flexible printed circuit boards" are made entirely of flexible film and directly attached to each other. 1:61-2:5; Figs. 2, 2-4b, 3 (elements 102, 104). AUO also expressly stated during prosecution that the flexible printed circuit board must be *entirely flexible* and does not include a foldable flat cable FC or *any* rigid or flex-rigid board. (D.I. 384 at 65.) AUO's argument that LGD's construction is confusing is equally baseless. LGD's construction makes clear that the flexible printed circuit board must consist entirely of a single flexible film with conductive patterns on its surface (printed circuit).

G. U.S. Patent 5,748,266 -- the "Color Filter Spacer" patent

The parties disagree on two critical issues: (1) whether the term "pillars" in claims 1 and 9 are necessarily color filter pillars; and (2) whether electrical connections between the storage capacitor lines and the common electrode can be located outside the pixel area.

1. *"pillars formed higher than other portions of the color filter"* and *"pillars of a color filter"*

The intrinsic evidence overwhelmingly supports LGD's constructions. (D.I. 384 at 51-53 (*citing* 4:65-5:6; Abstract; 4:53-57; 4:21-30; Figs. 8-11, and Summary of the Invention at 5:57-59).) The term pillars must be color filter pillars. Although AUO asserts that LGD's construction for "pillars formed higher than other portions of the color filter" is "technically incorrect," AUO provides no logical explanation for its position. The fact that the terms "color filter substrate" and "color filter" refer to distinct structures does not make LGD's construction inaccurate.

In fact, claim 1 reads in pertinent part "the color filter comprising a plurality of pillars formed higher than other portions of the color filter." The term "comprising" has a well-accepted meaning in patent law such that the term "plurality of pillars" is a part of the color filter in claim 1. *Crystal Semiconductor Corp. v. Tritech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1348 (Fed. Cir. 2001). Thus, to the extent that AUO's construction covers pillars made of material other than the color filter, the Court should reject AUO's construction. AUO cites to 8:20-23 to support its construction. However, that portion actually supports LGD's construction as it describes that "[i]n the first process, the color filter (32) is formed on the facing substrate (14), and the pillar (78) of a color filter is formed at a position corresponding to the hole (76) on the array substrate (12)." This language indicates, together with the visible delineation (dotted lines) in Figures 10 and 11, that the pillars 78 of a color filter are formed by patterning and superimposing red, green and blue color filter materials. *See* Figs. 8, 10, 11. The Summary of the Invention describes that "[a]s shown in Fig. 8, the present invention uses a pillar (78) of a color filter (32) instead of a spacer in order to keep a cell gap between two substrates constant." 4:65-67. These disclosures support LGD's construction that the pillars of a color filter are

patterned structures that are made of color filter material to act as a spacer.

2. *"the pillars are covered with the common electrode"*

AUO offers no construction of "the pillars are covered with the common electrode" and states that this term should be given its plain meaning. However, all the intrinsic evidence requires that "the common electrode be formed to cover the protruded surface of the pillars." (D.I. 384 at 53 (*citing* Abstract, Summary of the Invention, and Figs. 6-11).)

3. *"storage capacitance line"*

LGD's construction of a "storage capacitance line" as "a pattern of electrically conductive material within the pixel area for providing a reference voltage to the storage capacitors" is technically accurate and defines the term within the scope of the claimed invention. First, storage capacitor lines in an LCD device are formed by depositing a conductive layer such as metal and patterning the conductive layer by a photolithography process. Thus, LGD's construction is more technically correct and aids the jury in understanding the claims than AUO's abstract idea of "a line or wire of a conductive material." Second, the word "providing" in LGD's construction is correct in that storage capacitor lines in an LCD device provide a reference voltage, which is outputted from a voltage source, to the storage capacitors.

Third, AUO argues that there is no support for LGD's inclusion of the words "within the pixel area." The purported distinguishing feature of the patent over prior art is to supply a reference potential ("Vcom") from a storage capacitance line to a common electrode by using pillars. The Summary of the Invention clearly discloses that "a signal delay of a common electrode (30) is prevented from occurring by forming a portion for electrically connecting a common electrode (30) covering the pillar (78) of the color filter (32) with a storage capacitance line 28 *everywhere in a pixel area* and supplying a potential of the common electrode (30) from the storage capacitance line (28)." 4:65-5:06 (emphasis added). The patent also indicates that

there are prior LCD devices having an electrical connection between the common electrode and the storage capacitor lines outside the pixel area. 5:10-14 ("both potentials are supplied from the same supply source" which goes "back to a driving circuit"); *see also* Fig. 2, element 62.

Therefore, to the extent that AUO's proposed construction covers an electrical connection outside the pixel area between the storage capacitor line and the common electrode, the Court should not adopt AUO's proposed construction. *SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems*, 242 F.3d 1337, 1343 (Fed. Cir. 2001) ("claims should not be read so broadly as to encompass the distinguished prior art structure").

4. *"injecting liquid crystal between the array substrate and the color filter substrate"*

AUO incorrectly contends that the plain meaning to one of ordinary skill in the art and the intrinsic evidence support that the word "inject" means "introduce." (D.I. 378 at 23.) AUO fails to recognize, however, that in the LCD art, there are two methods to include liquid crystal between the two substrates: the conventional "injection" method and the "one-drop-fill" method. While the injection method provides liquid crystal through an injection hole by dipping attached substrates in liquid crystal under a vacuum condition, the one-drop-fill method typically dispenses liquid crystal on one of the two substrates before the attachment process. Accordingly, the word "injecting" has a distinct and unique meaning to one of ordinary skill in the LCD industry that liquid crystal is provided by the injection method. Significantly, the patent itself uses the word "injecting" to refer to the injection method. 8:35-38 ("the liquid crystal display panel 70 is finished by sealing the perimeter of the assembly with a *sealant* 64, *injecting* liquid crystal into the assembly *through an injection hole* (not illustrated), and closing the injection hole")(emphasis added). Thus, AUO cannot broaden this term by using the word "introduce" in an attempt to also cover the one drop fill method.

H. U.S. Patent 5,748,944 - the "Spacer Hardness" patent

As previously explained, this patent is directed to the mechanical hardness of pillar-like spacers that are patterned in the pixel area between the two substrates of an LCD device. (D.I. 384 at 54.) Recognizing the primary object of "the present invention is to provide a liquid crystal display which can inhibit the generation of low-temperature bubbles and serve as a spacer formed of photosensitive resin materials which are resistive to local load," the patent claims ranges of hardness values for the "pillar-like" spacers. 2:34-37; 8:22-10:3. In particular, the patent purports to provide equations for determining the dynamic hardness value (DH) and the plastic deformation hardness value (HV). The main claim construction disputes are: (1) whether the equations for determining DH and HV are such that the boundaries of the claimed ranges are ascertainable and reproducible; and (2) whether the term "at least one of the group consisting of" in claim 4 is indefinite due to the nature of at least one element of the group.

1. *"dynamic hardness value"* and *"hardness value of plastic deformation"*

AUO urges these terms are not indefinite with little more than reference to equations and a bald assertion that "one of ordinary skill in the art can easily understand the 'ordinary and accustomed meaning' of the claim terms based on the specification." (D.I. 378 at 24-25.) This position, however, fails to recognize that the identified equations for DH and HV include a constant "K" that is dependent on the geometry of indentors. Moreover, the patent does not specify which indentor and constant K should be used to measure DH and HV of spacers in an LCD device. Selection of one indentor for testing could result in a measured value that falls within the range of the patent, whereas a different indentor testing the same material could result in a value that falls outside the range. Pharr Decl. ¶ 4. The equations alone, therefore, do not adequately define these claim limitations. Further, even if the constant "K" had been defined,

the measurements for DH and HV could significantly vary depending on other test parameters, such as (a) the penetration depth of the indentor in relation to the thickness of the spacers, (b) the value of maximum load (Pmax), (c) the rate at which the indentor is applied to the spacers, and (d) the underlying substrate during measurement. *Id*. ¶ 5. Thus, the claimed ranges of DH and HV do not present a clear boundary and are indefinite under 35 U.S.C. § 112, ¶ 2.

2. *"at least one of the group consisting of"*

Although AUO contends that this term is "standard language used for a Markush claim, which lists specified alternatives of a group in a patent claim," AUO ignores the fact that this term includes alternatives that would defeat the purported purpose of the invention. (D.I. 378 at 25.) Indeed, this term is indefinite because at least the alternative "column occupancy ratio" is not a material characteristic and thus it ***alone*** does not provide a basis for selecting a photosensitive resin for placing spacers in an LCD device, as required by claim 4. Pharr Decl. ¶ 6. The claimed range of the "column occupancy ratio" alone, without any mechanical property of the spacer material, cannot achieve what the patent points out as advantages over the prior art such as inhibition of low-temperature bubbles and resistance to local load. 1:31-2:37. Where the written description points out advantages over the prior art, "the claims should not be read so broadly as to encompass the distinguished prior art structure." *SciMed*, 242 F.3d at 1343.

CONCLUSION[7]

For the foregoing reasons, LGD requests that the Court adopt LGD's claim constructions.

September 4, 2008 BAYARD P.A.

/s/ Stephen B. Brauerman (sb4952)

[7] Exhibits referenced are either to the Mollo Declarations or to the parties' joint exhibits.

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